

CLAIMS

What is claimed is:

1. A step apparatus for a vehicle having a door and a rocker panel, the apparatus comprising:

 a step disposed at and in operable communication with the door, the step having a retracted position in response to the door being closed and a deployed position in response to the door being at least partially open;

 wherein the vehicle has a first ground clearance in response to the door being closed and the step retracted, and a second ground clearance in response to the door being open and the step deployed, the first ground clearance being equal to or greater than the second ground clearance; and

 wherein the first ground clearance is defined by the vehicle independent of the step apparatus.

2. The apparatus of Claim 1, wherein:

 the step is fully deployed in response to the door moving from a closed position to a partially open position.

3. The apparatus of Claim 2, wherein the partially open position results from a lateral door movement of equal to or less than about 28 inches.

4. The apparatus of Claim 3, wherein the partially open position results from a lateral door movement of equal to or less than about 15 inches.

5. The apparatus of Claim 1, wherein:

 with respect to the rocker panel, the step has a first horizontal displacement in the retracted position and a second horizontal displacement in the deployed position, the second horizontal displacement being greater than the first horizontal displacement.

6. The apparatus of Claim 5, wherein the second horizontal displacement is equal to or greater than about 6-inches.

7. The apparatus of Claim 6, wherein the second horizontal displacement is equal to or greater than about 9-inches.

8. The apparatus of Claim 6, wherein the second horizontal displacement is equal to or less than about 15-inches.

9. The apparatus of Claim 1, wherein:
the step is biased toward the retracted position;
the door includes a drive surface for driving the step to the deployed position in response to the door being opened; and
the step is locked in the deployed position when driven to the deployed position.

10. The apparatus of Claim 9, further comprising:
a locking surface and a retaining surface; and
a latch mechanism in operable communication with the door, the latch mechanism having a locking portion and a retaining portion;
wherein the locking portion engages the locking surface to lock the step in the deployed position.

11. The apparatus of Claim 10, wherein:
in response to the door being moved from an open position to a closed position, the locking portion of the latch mechanism is disengaged from the locking surface, the step is biased toward and moves to the retracted position, and the retaining portion of the latch mechanism is driven under the influence of a bias force to engage the retaining surface to retain the step in the retracted position.

12. The apparatus of Claim 11, wherein:

in response to the door being moved from the closed position to the open position, the retaining portion of the latch mechanism is driven, in opposition to the bias force, out of engagement with the retaining surface, thereby enabling the step to move to its deployed position.

13. The apparatus of Claim 11, further comprising:

a damper disposed between the step and the vehicle, the damper adapted to dampen the movement of the step from the deployed position to the retracted position.

14. The apparatus of Claim 1, wherein the step moves to and from the deployed position and to and from the retracted position in the absence of motor assistance.

15. The apparatus of Claim 1, wherein:

the step includes an offset pivot about which the step rotates vertically between the retracted and deployed positions, the step in the deployed position providing an entry elevation that is less than the entry elevation in the absence of the step.

16. The apparatus of Claim 15, wherein the entry elevation in the presence of the step is about 50 percent of the entry elevation in the absence of the step.

17. The apparatus of Claim 9, wherein:

the step includes a ramp portion; and

the drive surface includes a second drive surface arranged to engage with the ramp portion in response to the door moving from a partially open position to a substantially open position.

18. The apparatus of Claim 17, wherein the ramp portion includes a light.

19. A step apparatus for a vehicle having a door and a door frame, the apparatus comprising:

a step having a pivot, the pivot disposed proximate the door frame, the step having a retracted position in response to the door being closed and a fully deployed position in response to the door being at least partially open; and

a bias force biasing the step in the retracted position;

wherein the step rotates vertically from the retracted position to the deployed position about the pivot in response to the door being opened, the door having a drive surface for engaging the step to drive the step to the deployed position against the bias force.

20. The apparatus of Claim 19, further comprising:

a latch mechanism in operable communication with the door and the step, the latch mechanism having a locking position and a retaining position, the locking position locking the step in the fully deployed position in response to the door being opened, the retaining position retaining the step in the retracted position in response to the door being closed;

wherein in response to the door being opened, the latch mechanism is driven out of the retaining position thereby enabling the step to be driven to the deployed position; and

wherein in response to the door being closed, the latch mechanism is disengaged from the locking position thereby enabling the step under the influence of the bias force to be driven to the retracted position.

21. The apparatus of Claim 20, wherein:

the step is oriented in a substantially vertical plane in the retracted position and in a substantially horizontal plane in the deployed position; and
the step in the deployed position has a lateral dimension with respect to the door frame of equal to or greater than about 6-inches and equal to or less than about 18-inches.

22. The apparatus of Claim 21, wherein:

the step in the deployed position has a lateral dimension with respect to the door frame of equal to or greater than about 9-inches and equal to or less than about 15-inches.

23. A method of operating a step of a vehicle, the method comprising:

opening a door of the vehicle;

via the opening action of the door, rotating the step vertically from a retracted substantially vertical position to a deployed substantially horizontal position, the rotating being in opposition to a bias force biasing the step in the retracted position; and

locking the step in the deployed position.

24. The method of Claim 23, further comprising:

closing the door of the vehicle;

in response to the door being closed, unlocking the step from the deployed position;

under the influence of the bias force, rotating the step vertically from the deployed substantially horizontal position to the retracted substantially vertical position; and

holding the step in the retracted position via a cam and cam follower arrangement.

25. The method of Claim 24, wherein the rotating the step from the deployed position to the retracted position further comprises damping the rotating of the step from the deployed position to the retracted position.